



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
-----------------	-------------	----------------------	---------------------	------------------

10/765,881

01/29/2004

Toshiyuki Suzuki

2635-200

2291

23117 7590 11/30/2009
NIXON & VANDERHYE, PC
901 NORTH GLEBE ROAD, 11TH FLOOR
ARLINGTON, VA 22203

EXAMINER

OLSEN, KAJ K

ART UNIT

PAPER NUMBER

1795

MAIL DATE

DELIVERY MODE

11/30/2009

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/765,881	Applicant(s) SUZUKI ET AL.	
	Examiner KAJ K. OLSEN	Art Unit 1795	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 11 August 2009.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) See Continuation Sheet is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,3,5,7,11,13,17,19,25,27,29,31,33,35,37,45,51,59,67,75-82,85-93,99-103,114-116,119-123,132-136,145,147 and 149-151 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

Continuation of Disposition of Claims: Claims pending in the application are

1,3,5,7,11,13,17,19,25,27,29,31,33,35,37,45,51,59,67,75-82,85-93,99-103,114-116,119-123,132-136,145,147 and 149-151.

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1, 3, 5, 7, 11, 13, 17, 19, 25, 27, 35, 37, 45, 51, 59, 75-82, 85, 89-92, 100-103, 114-116, 123, 133-136, 145, and 149-151 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Suzuki et al (USP 6,478,940) (hereafter “Suzuki ‘940”).

3. With respect to claims 1, 3, 5, 7, 11, 13, 17, 19, 25, 27, 35, 37, 45, 51, 59, 75-82, 85, 89-92, 100-103, 114-116, 123, 133-136, and 145, these claims remains rejected over the teaching of Suzuki ‘940 for the reasons set forth in the previous office actions. Applicant has amended independent claim 1 to include the limitations of now cancelled claims 23 and 104, independent claim 45 to include the limitations of claims 117 and 118, and independent claim 75 to include the limitations of 83 and 84. These new limitations are all drawn to the embodiment of fig. 9. However, as the examiner discusses in detail in the arguments below, none of these new limitations further define the actual structure of the apparatus, but merely further define the actual process utilized for the determination of the characteristic line RG of the present invention.

Art Unit: 1795

4. With respect to new claims 149-151, these claims further define the embodiment of fig. 9. However, as the examiner points out in greater detail below, fig. 9 appears to be drawn to a process for further choosing resistances R1, R2, and R3 for the circuit of fig. 1 (p. 25, ll. 21-26) and these process steps do not further define the actual structure of the invention.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 1, 3, 5, 7, 11, 13, 17, 19, 25, 27, 35, 37, 45, 51, 59, 75-82, 85, 89-92, 100-103, 114-116, 123, 133-136, 145, and 149-151 are rejected in the alternative under 35 U.S.C. 103(a) as being unpatentable over Suzuki '940 in view of JP 08-029,388 (hereafter "JP '388").

7. As discussed above and in the previous office actions, the examiner does not believe applicant has defined its applied voltage line in a manner that reads away from the means of the prior art. Whether or not the prior art recognized that water decomposition affected the limit current behavior of the gas sensor doesn't by itself further define the choice of applied voltage line. However, even if the examiner were to interpret the reasons for utilizing the various lines as further defining either the lines or the apparatus itself, then many of these choices of lines would be obvious over the further teaching of JP '388. In particular, JP '388 recognized that the gas concentration detection range should be divided up into a plurality of portions to ensure that the voltage utilized at each current was within the limit current region for that current. JP '388 also

Art Unit: 1795

recognized that the width of the limit current regions may be different at different A/F ratios with the width being narrower at rich levels in comparison with lean levels. In response, JP '388 suggested the use of an applied voltage line that was overall shallower than the line that would correspond to resistance governing region relied on by Suzuki '940. Compare fig. 4 and 7 and see paragraphs 0019-0022. It would have been obvious to one of ordinary skill in the art at the time the invention was being made to utilize the teaching of JP '388 and utilize a linear applied voltage line for Suzuki '940 that is shallow enough to extend through all the limit current regions for the sensor in order to ensure that the choice of voltage for each current point is safely with a limit current region for that current.

8. Claims 29, 31, 33, 86-88, 99, 119-122, and 132 are rejected under 35 U.S.C. 103(a) as being unpatentable over Suzuki '940 or Suzuki '940 in view of JP '388 as applied above, and further view of Takami et al (USP 5,935,400).

9. These claims are drawn to the use of a characteristic line that has a larger inclination in an outer region and in a resistance governing region than in the limit current region. Suzuki '940 and JP '388 do not explicitly suggest doing so. However, Takami teaches that the voltage level at the outer regions of the characteristic line L11 and L13 can be set to be at constant voltages to keep the sensor from generating excessive current. See fig. 18 and col. 20, ll. 32-49. Hence, Takami suggest the use of a characteristic line in the outer regions to have a slope larger (i.e. infinite) in comparison with a slope in a middle limit current region of the characteristic line. It would have been obvious to one of ordinary skill in the art at the time the invention was being made to utilize the teaching of Takami for the sensor of Suzuki '940 or Suzuki '940 in view of

Art Unit: 1795

JP '388 in order to prevent excessive current flow at the outer regions of the sensor's operating range.

10. Claims 67, 93, and 147 are rejected under 35 U.S.C. 103(a) as being unpatentable over Suzuki '940 or Suzuki '940 in view of JP '388 as applied to the claims above, and in further view of Suzuki et al (USP 4,664,773) (hereafter "Suzuki '773").

11. With respect to claims, Suzuki '940 or Suzuki '940 and JP '388 set forth all the limitations of the claims, but did not explicitly recite the presence of a rich side limit to the air-fuel ratio range set at 11 or less. Suzuki '940 appears to show a limit of 12 but doesn't specify any criticality for the choice of that ratio. Suzuki '773 teaches that limit current sensors can be utilized all the way down to a λ of 0.5 (A/F of about 7.3). See fig. 5. It would have been obvious to one of ordinary skill in the art at the time the invention was being made to utilize the teaching of Suzuki '773 for the apparatus of Suzuki '940 or Suzuki '940 and JP '388 so as to extend the utility of the sensor down to even A/F ratio detection range down to even richer exhaust gases.

Response to Arguments

12. Applicant has amended independent claim 1 to include the limitations of now cancelled claims 23 and 104, independent claim 45 to include the limitations of claims 117 and 118, and independent claim 75 to include the limitations of 83 and 84. Applicant's basic argument is that the relied on prior art does not teach every element of the claim. However, as the examiner has been urging throughout the prosecution of this case, most of the limitations of these claims, including claims 23, 83, 84, 104, 117, and 118, is not drawn to structure *per se* but the process of

Art Unit: 1795

which applicant chose to configure the apparatus. In other words, the various new limitations of claims 1, 45, and 75 are not setting forth any further structure, but rather are setting forth a process for setting the voltage level via a plurality of voltage level ranges in a plurality of temperature conditions, choosing a line that passes through all the voltage levels and applying that to the sensor. Applicant does not appear to have an apparatus configured to perform all these processes, but rather these processes are performed so as to determine how the device is to be constructed. More specifically, applicant is performing a process to determine what resistances R1, R2, and R3 in fig. 1 and 12 to utilize to define the characteristic line RG. For example, it would appear that the embodiment of fig. 9 utilizes the same circuit as the embodiment of fig. 1 with only the choices of R1, R2, and R3 being possibly tweaked as a result of the temperature considerations of fig. 9 being taken into account (see p. 29, ll. 3-9 for a discussion of how fig. 9 is drawn to just determining a3 and b3 and p. 25, ll. 21-26 where the discussion of how the RG inclination is set to go through a3 and b3 by adjusting R1-R3). Hence, the end product of all of this claim language is a gas sensor having a characteristic line of broadly defined slope that results from this set forth process. As MPEP 2113 makes clear, unless the process utilized to construct the product necessarily results in a different product, the process for which the product is made is either the same or obvious over any process utilized by the prior art. In this case, the various claims are drawn to how applicant chooses the characteristic line as it is not clear that the process utilized by the present invention results in a characteristic line that is any different than the characteristic lines disclosed or rendered obvious by the prior art. With particular attention to the new limitations of claims 1, 45, and 75, these new limitations appear to be drawn to the embodiment of fig. 9 where the location and slope of the characteristic line RG

Art Unit: 1795

is shown to be chosen as a midpoint between arbitrary low and high temperatures (700 and 1000 °C respectively). For fig. 9, RG is chosen using points a3 and b3 and the end result of this process appears to be a characteristic line where the slope is roughly equivalent to the slope of the line L2 for a 700 °C operating temperature. Other than the thought process for which this line was chosen, how is the actual line any different from the line disclosed by Suzuki '940? Suzuki '940 already disclosed operating the sensor at 700 °C (col. 12, ll. 36-39) and already disclosed that one can utilize a characteristic line L1 (equivalent to RG of the present invention) that is generally parallel to the left side slope of the limit current response, which would be 700 °C for Suzuki '940 (compare fig. 3 of Suzuki '940 with fig. 9 of the present invention). If the process of the present invention results in the choice of a characteristic line that already overlaps a characteristic line from the prior art, then there is no structural distinction between the apparatus of the prior art (i.e. Suzuki '940 or Suzuki '940 in view of JP '388) and the present invention.

Conclusion

13. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a).

Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period

Art Unit: 1795

will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to KAJ K. OLSEN whose telephone number is (571)272-1344. The examiner can normally be reached on M-F 5:30-2:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nam X. Nguyen can be reached on 571-272-1342. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Kaj K Olsen/
Primary Examiner, Art Unit 1795
November 24, 2009